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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/568,690

12/04/2006

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30572/41855

2789

4743 7590 09/21/2009
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EXAMINER

HAILEY, PATRICIA L

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

09/21/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/568,690	Applicant(s) BARKHORDARIAN ET AL.	
	Examiner PATRICIA L. HAILEY	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-21 and 24-27 is/are rejected.
- 7) ☒ Claim(s) 22 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/17/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

Applicants' Preliminary Amendment, filed on February 17, 2006, has been made of record and entered. In this amendment, claims 1-23 have been amended to eliminate multiple claim dependency and to recite proper U. S. patent claim language, and claims 24-27 have been added.

Claims 1-27 are now pending in this application.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicants' Priority Document was filed on February 17, 2006.

Claim Objections

2. ***Claim 9 is objected to because of the following informalities:***

In claim 9, the phrase "wherein this exhibits" should be amended to recite the phrase "wherein said material exhibits".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 13 and 24-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 13 and 24-27 are indefinite because claim 13 lacks antecedent basis for the phrase “wherein the milling process...”. Claim 10, from which claim 13 depends, does not recite or refer to a “milling process”.

It appears that claim 13 should depend from claim 12.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 4, 5, 8, 11, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Minoura et al. (Japanese Publication No. 10-092422).

Regarding **claims 1, 4, and 5**, Minoura et al. teach a hydrogen storage alloy electrode (“hydrogen-storing material”), containing calcium carbonate (“metal carbonate”, “carbonate of an elemental metal”, “Ca”) in its active material layer. See the Abstract of Minoura et al.

Regarding **claim 8**, the limitation therein “...is formed in situ...” renders this claim a product-by-process claim. It has been held that:

"Any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct, not the examiner to show that the same is a process of making." In re Brown, 173 U.S.P.Q. 685 and In re Fessmann, 180 U.S.P.Q. 324.

Regarding **claim 11**, Minoura et al. teach that the calcium carbonate is present "...as 0.1 to 3.0 % of the weight to a hydrogen storing metal alloy." See paragraph [0006] of Minoura et al. The skilled artisan would anticipate the mole percent of the calcium carbonate in Minoura et al. would fall within the respectively claimed range.

Regarding **claim 12**, Minoura et al. teach that the hydrogen storing metal alloy powder components are subjected to "machinery grinding", see paragraph [0007].

In view of these teachings, Minoura et al. anticipate claims 1, 4, 5, 8, 11, and 12.

7. Claims 1, 4, 5, and 7-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogura et al. (U. S. Patent No. 6,171,727).

Regarding **claim 1**, Ogura et al. teach a hydrogen storing alloy with its surface covered by a layer containing at least carbonate (see Abstract), or with a compound containing at least carbonic acid. See col. 3, lines 38-42 of Ogura et al.

Regarding **claims 4 and 5**, Ogura et al. teach that alkali and alkaline earth metals can be "used in the form of carbonate"; exemplary metals include lithium, sodium, potassium, magnesium, calcium, and barium. See col. 4, lines 46-49 of Ogura et al.

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Regarding **claim 7**, Ogura et al. teach that the carbonic acid-containing compound on the surface of the hydrogen storing alloy can be expressed by the formula $M^1(CO_3)_x \cdot M^2(OH)_y$, where each of M^1 and M^2 represents one or more than one component elements of the hydrogen storing alloy, e.g., Zr, Ti, Ni, Mn, V, Cr, Fe, Co, and Al. See col. 5, lines 5-22 of Ogura et al.

Regarding **claim 8**, the limitation therein "...is formed in situ..." renders this claim a product-by-process claim. It has been held that:

"Any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct, not the examiner to show that the same is a process of making." In re Brown, 173 U.S.P.Q. 685 and In re Fessmann, 180 U.S.P.Q. 324.

Regarding **claims 9-11**, Ogura et al. teach that the weight ratio of the carbonate relative to the hydrogen storing alloy is between 0.05 and 3 wt. %, and that the granular carbonate exhibits a particle size of between 0.1 and 5 μm (100-5000 nm; "nanocrystalline structure"). See co. 4, lines 49-53 of Ogura et al.

In view of these teachings, Ogura et al. anticipate claims 1, 4, 5, and 7-11.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1, 12-21, and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klassen et al. (U. S. Patent No. 6,752,881) in view of Minoura et al. (Japanese Publication No. 10-092422).

Regarding claim 12, Klassen et al. teach a method for producing a metalliferous hydrogen storage material, wherein the metalliferous material and or a catalyst are subjected to a mechanical grinding procedure. See col. 2, lines 57-63 of Klassen et al.

Regarding **claims 13-17 and 24-27**, Klassen et al. teach that the grinding procedure may be selected, depending on the metalliferous material and/or the catalyst, to be differently long so as to achieve the optimal desired reaction surface and an optimal distribution of the catalyst on the metalliferous material. Further, the metalliferous material may be first subjected to the grinding, followed by adding the catalyst subsequently to the grinding process, or that this process may be reversed (i.e., the catalyst is subjected to grinding followed by the metalliferous material. See col. 2, line 64 to col. 3, line 10 of Klassen et al.

Regarding **claims 18 and 19**, Klassen et al. teach that the duration of the milling process is preferably in the area of 1 to 200 hours, see col. 3, lines 17-23 of Klassen et al.

Regarding **claims 20 and 21**, Klassen et al. teaches that the milling process is carried out in an inert atmosphere, wherein the inert gas is preferably argon, see col. 3, lines 11-16 of Klassen et al.

Klassen et al., while teaching metal oxides as the catalyst (col. 2, lines 40-49), does not teach or suggest the catalyst being a metal carbonate, as recited in **claim 1**.

Minoura et al. teach a hydrogen storage alloy electrode ("hydrogen-storing material"), containing calcium carbonate ("metal carbonate", "carbonate of an elemental metal", "Ca") in its active material layer. See the Abstract of Minoura et al.

Additionally, Minoura et al. teach that the hydrogen storing metal alloy powder components are subjected to "machinery grinding", see paragraph [0007].

It would have been obvious to one skilled in the art at the time Applicants' invention was made to modify the teachings of Klassen et al. by employing calcium carbonate as a catalyzing agent in a hydrogen storage material, as suggested by Minoura et al., motivated by these references' teachings regarding hydrogen storage materials. Further, because calcium is disclosed by Klassen et al. as an exemplary metal for Patentees' metal oxide (col. 2, line 41), the skilled artisan would reasonably expect that calcium, in the form of a carbonate, would suitably perform as a catalyst in a hydrogen storage alloy material, motivated by the teachings of Minoura et al.

Allowable Subject Matter

12. Claims 22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter:

The cited references of record fail to teach or suggest the limitations of claims 22 and 23, regarding the employment of either an organic solvent or a CO- and/or CO₂-containing atmosphere during the claimed milling process.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICIA L. HAILEY whose telephone number is (571)272-1369. The examiner can normally be reached on Mondays-Fridays, from 7:00 a.m. to 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICIA L. HAILEY/
Primary Examiner, Art Unit 1793
September 18, 2009

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